

STUDY OF HIGH LYING RESONANCES IN ${}^9\text{Be}$ BY THE MEASUREMENT OF (p,p), (p, α) AND (p,d) REACTIONS

A. Lepine-Szily¹, E. Leistenschneider², P. Descouvemont³, D.R. Mender Jr.⁴, R. Lichtenthaler¹, M.A.G. Alvarez¹, R. Pampa Condori⁴, P.N. de Faria⁴, V. Guimaraes¹, V. Scarduelli¹, E.L.A. Macchione¹, L.R. Gasques¹, V.A.P. Aguiar¹, J. Duarte¹, K.C.C. Pires¹, V. Morcelle⁵, M.C. Morais⁶, V.A. Zagatto¹, M. Assuncao⁷, T. Britos⁷

¹ Instituto de Fisica Universidade de Sao Paulo, S.P. Brazil;

² TRIUMF, Vancouver, B.C. Canada;

³ Universite Libre de Bruxelles, Brussels, Belgium;

⁴ Instituto de Fisica, Universidade federal Fluminense, Niteroi, Brazi;

⁵ Universidade Federal Rural do Rio de Janeiro, Seropedica, Brazil,

⁶ CEFET/RJ, Petropolis, Brazil;

⁷ Departamento de Ciencias Exatas e da Terra, UNIFESP, Diadema, Brazil;

The (p, p), (p, α) and (p, d) reactions on ${}^8\text{Li}$ were measured at low energies . The experiment was performed using a thick $[\text{CH}_2]_n$ target and a radioactive ${}^8\text{Li}$ beam available at the RIBRAS facility of Sao Paulo . This experiment represents an upgrade of a previous experiment, where only the ${}^8\text{Li}$ (p, α) ${}^5\text{He}$ cross section was measured. High lying resonances of ${}^9\text{Be}$, which are still uncertain, could be studied in this way. The detection of several reaction channels allows a reliable determination of the resonance parameters, such as energy, width and spin-parity. In the deuteron channel we could observe the same resonance decaying to $d+{}^7\text{Li}_{\text{gs}}$ and to $d+{}^7\text{Li}^*$. The properties of the resonances are determined by a R-matrix analysis, which provides evidence for a significant clustering as well in the (p, α) as in the (p,d) channels. The experimental data and the multi-channel R-matrix analysis will be presented.